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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.     | CONFIRMATION NO. |
|---|-------------|----------------------|-------------------------|------------------|
| 10/760,300  | 01/21/2004  | Meng-Seng Chen       |                         | 3229             |
| 7590  | 10/16/2007  |                      | EXAMINER                |                  |
| Chiou, Ta-gang<br>14th Floor<br>One Broadway<br>Cambridge, MA 02142 |             |                      | HEIBER, SHANTELL LAKETA |                  |
|   |             |                      | ART UNIT                | PAPER NUMBER     |
|   |             |                      | 2617                    |                  |
|   |             |                      | MAIL DATE               | DELIVERY MODE    |
|   |             |                      | 10/16/2007              | PAPER            |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

|                              |                             |                  |
|------------------------------|-----------------------------|------------------|
| <b>Office Action Summary</b> | Application No.             | Applicant(s)     |
|                              | 10/760,300                  | CHEN ET AL.      |
|                              | Examiner<br>Shantell Heiber | Art Unit<br>2617 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 20 September 2007.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-9 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-9 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 1/21/04 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_
- 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_  
 5) Notice of Informal Patent Application  
 6) Other: \_\_\_\_\_

## DETAILED ACTION

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

### ***Response to Arguments***

2. Applicant's arguments with respect to claims 1-9 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (Lee), U.S. Patent No. 6,138,025 in view of Seraj, U.S. Patent No. 6,535,745.

**Regarding Claim 1**, Lee discloses a method for determining a plurality of registration areas in a wireless communication system, comprising the steps of: determining a plurality of mobility data (**loading characteristics**) corresponding to a plurality of first partition units respectively and an overall cost (**paging load and registration load**) of a plurality of first registration areas, wherein each of the first registration areas includes at least one of the first partition units; generating a plurality of second registration areas through a registration area determining procedure, wherein the second registration areas are constructed based on the mobility data of the first partition units; determining an overall cost of the second registration areas; comparing

the overall cost of the first registration areas and the second registration areas; determining a plurality of third registration areas and second partition units based on the result of comparison, wherein at least one of the second partition units is generated by combining at least two of the first partition units based on the mobility data of the corresponding first partition units when the overall cost of the first registration areas is lower than or equal to the overall cost of the second registration areas; and repeating the above steps to generate a plurality of fourth registration areas and then to determine a plurality of fifth registration areas and third partition units. (**Col. 5, line 16-Col. 6, line 7**).

Lee fails to disclose at least one of the second partition units is generated by partitioning one of the first partition units based on the mobility data of the corresponding first partition units when the overall cost of the first registration areas is higher than the overall cost of the second registration areas.

In a similar field of endeavor, Seraj discloses a paging network optimization utilizing handoff statistics. Seraj further discloses at least one of the second partition units is generated by partitioning one of the first partition units based on the mobility data of the corresponding first partition units when the overall cost of the first registration areas is higher than the overall cost of the second registration areas; and repeating the above steps to generate a plurality of fourth registration areas and then to determine a plurality of fifth registration areas and third partition units. **The location areas (registration areas) consist of a plurality of cells (partition units) in a wireless communications network utilizing the paging traffic and handoff traffic**

**statistics (mobility data) of the cells. When defining a location area, the cells with the highest volume of traffic is determined and combined in order to determine if the maximum paging capacity has been exceeded. If the maximum capacity of the working location area has been exceeded by the combined paging traffic of all the cells which make up the working location area, then the last cell added is removed and remains in the service area for later assignment of other location areas.** Col. 4, lines 48-61 and Col. 6, line 9-Col. 7, line 12.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to define location areas within a paging area consisting of a plurality of cells utilizing the paging traffic and handoff traffic statistics related to the cells (Seraj-Col. 1, lines 6-10) by reducing paging load by creating a plurality of location areas such that registration requirements between the location areas are minimized (Lee-Col. 1, lines 16-22).

**Regarding Claim 2,** Lee discloses wherein the method is executed recursively until a plurality of  $(2n)$ th registration areas and  $n$ th partition units are determined that each of the  $(2n)$ th registration areas includes only one  $n$ th partition unit and the overall cost of the  $(2n-1)$ th registration areas is smaller than or an equal to the overall cost of the  $(2n)$ th registration areas (**Col. 11, lines 37-63**).

**Regarding Claim 3,** Lee discloses wherein the mobility data at least include a plurality of mobility rates (**Col. 7, lines 13-25**).

**Regarding Claim 4,** Lee discloses wherein the mobility rates are determined by a plurality of traffic sources in the wireless communication system through at least one

of the following operations which are gathering historical data, simulation and estimation (Col. 7, lines 13-25).

**Regarding Claim 5**, Lee discloses wherein the second partition units are determined based on a plurality of loading limits of the wireless communication system (Col. 6, line 64-Col. 7, line 12).

**Regarding Claim 6**, Lee discloses wherein the loading limits at least include a plurality of constraints corresponding to any physical or virtual equipment in the wireless communication system (Col. 4, lines 51-62).

**Regarding Claim 7**, Lee discloses wherein the registration area determining procedure is at least one of the K-L algorithm and the F-M algorithm (Col. 11, lines 14-36).

**Regarding Claim 8**, Lee discloses wherein the registration area is determined by at least one of the following: a location area (LA) of a GSM system, a routing area (RA) of a packet-switched or a 3G systems, a registration location area (RLA)/overlapping location area (OLA) and a paging area of a PDC and a PHS system, a cell area (CA) of a 3G systems, and an UTRAN Registration Area of a UMTS WCDMA system (Col. 4, line 51-Col. 5, line 4).

**Regarding Claim 9**, Lee discloses wherein when the first partition units are non-partitionable, generating the second partition units by combining at least two of the first partition units based on the mobility data of the corresponding first partition units is done (Col. 12, line 6-Col. 13, line 23).

***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Chiou et al., U.S. Publication No. 2004/0165561 discloses a system for constructing a mobility model for use in mobility management in a wireless communication system and method thereof.

Aji et al., U.S. Publication No. 2004/0044979 discloses a constraint-based global router for routing high performance designs.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shantell Heiber whose telephone number is 571-272-0886. The examiner can normally be reached on Monday-Friday 7:00am-3:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester Kincaid can be reached on 571-272-7922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

*SLH*  
SLH

*Lester G. Kincaid*  
LESTER G. KINCAID  
SUPERVISORY PRIMARY EXAMINER